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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,086	05/31/2001	Alexandra Debray	12406-008001	6405

7590 11/06/2002
Fish & Richardson
225 Franklin Street
Boston, MA 02110-2804

EXAMINER

COLON, GERMAN

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/786,086

Applicant(s)

DEBRAY ET AL.

Examiner

German Colón

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to because in Fig. 1, Y-axis label is not in English. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.

- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

The Examiner notes that some of the headings for the different sections in the application are missing. Appropriate correction is required.

Claim Objections

3. Claim 12 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 12 has not been further treated on the merits.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2, 7, 10-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by

"such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

Regarding claims 2 and 7, claims 2 and 7 recite the broad recitation "radiation in the range of 400 to 500 nm", and the claim also recites "particularly 420 to 490 nm" which is the narrower statement of the range/limitation.

Regarding claim 10, claim 10 recites the broad recitation "radiation in the range of 400 to 500 nm", and the claim also recites "particularly 430 to 480 nm" which is the narrower statement of the range/limitation.

Referring to claims 11 and 12, claims 11 and 12 are rejected over the reasons stated in the rejection of claim 10 because of their dependency status on claim 10.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Berkstresser et al. (US 4,550,256).

Regarding claim 1, Berkstresser discloses an arrangement of luminescent materials for excitation by means of a radiation source (see Col. 1, line 17) and involving the use of a luminescent material having a Ce-activated garnet (YAG:Ce) structure $A_3B_5O_{12}$, in which the first component A is Y and Tb, and B is Al (see Col. 3, line 62, $Y_{3-x-y}Ce_xTb_yAl_5O_{12}$).

Regarding claim 2, Berkstresser discloses the claimed luminescent materials but is silent regarding the limitation of "said luminescent materials being excitable by radiation in the range of 400 to 500 nm". However, it is elementary that mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. *In re Swinehart*, 169 USPQ 226 (CCPA 1971). Thus, the functional limitation of "the luminescent materials being excitable by radiation in the range of 400 to 500 nm" is taught by Berkstresser under the principles of functional inherency.

Further, a chemical composition and its properties are inseparable. Therefore, since the prior art teaches the chemical structure, the properties applicant discloses and claims are necessarily present.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berkstresser et al. (US 4,550,256) in view of Shimizu et al. (US 5,998,925).

Berkstresser discloses a garnet with the structure $Y_3(Al, Ga)_5O_{12}:Ce$ [YAG:Ce] and a garnet with a structure $(Y_{3-x-y-z}Ce_xTb_yRE_z)(Al_{5-w}X_w)O_{12}$, where $0 < x \leq 0.06$, $0 < y \leq 0.5$, $0 \leq z \leq 2$, $0 \leq w \leq 3$ and X is Ga (Col. 3, line 62, shows a phosphor with the structure $Y_{3-x-y}Ce_xTb_yAl_5O_{12}$ [YAG:Ce:Tb]). Berkstresser fails to disclose a mixture of luminescent materials containing both garnets.

However, in the same field of endeavor, Shimizu discloses an LED with luminescent materials (phosphor) and teaches that the phosphor may contain two or more yttrium-aluminum garnet fluorescent materials of different composition, activated with cerium and that with such a configuration, light of desired color can be emitted by controlling the emission spectrum of the phosphor according to the property of the light emitting component; so in order to have a light of specified wavelength, it is preferable that the phosphor contains two or more fluorescent materials (see Col. 4, lines 15-26 and Col. 5, lines 61-65). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mixture of luminescent materials (phosphor) containing both garnets (YAG:Ce and YAG:Ce:Tb) since Shimizu teaches that the phosphor may contain two or more yttrium-aluminum garnet fluorescent materials of different composition, activated with cerium and that with such a configuration, light of desired color can be emitted by controlling the emission spectrum of the phosphor according to the

property of the light emitting component; so in order to have a light of specified wavelength, it is preferable that the phosphor contains two or more fluorescent materials.

10. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkstresser et al. (US 4,550,256) in view of Butterworth et al. (US 5,847,507).

Regarding claim 9, Berkstresser discloses a luminescent material having a Ce-activated garnet (YAG:Ce) structure $A_3B_5O_{12}$, in which the first component A is Y and Tb, and B is Al (see Col. 3, line 62, $Y_{3-x-y}Ce_xTb_yAl_5O_{12}$). Berkstresser further teaches the use of said luminescent materials in cathodoluminescent devices (CL devices, such as CRTs) and photoluminescent devices (PL devices, such as LEDs) (see Col. 1, lines 13-17). Yet, Berkstresser is silent in reference to the structure of such devices.

However, Butterworth discloses an LED which uses luminescent material with the general formula YAG:Ce, comprising a radiation source that emits radiation in the blue region of the optical region of the spectrum, said radiation being converted partially or completely into longer-wave radiation by means of the arrangement of luminescent materials and in the case of partial conversion, converted radiation is mixed with emitted radiation from said source to produce white light (see Col. 1, lines 40-43 of '507). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the luminescent material disclosed by Berkstresser in an LED device of Butterworth since Berkstresser acknowledges the general suitability of the luminescent material in photoluminescent devices, such as LED.

Regarding claim 10, Berkstresser-Butterworth discloses the emitted radiation from the radiation source being of 470 nm (see Col. 3, line 39 of '507). The same motivation for combining stated in claim 9 above applies.

Regarding claim 11, Berkstresser-Butterworth discloses the radiation source being a blue-emitting light emitting diode based on GaN (see Col. 1, line 34 of '507).

11. Claims 4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (US 5,998,925) in view of Berkstresser et al. (US 4,550,256).

Regarding claim 4, Berkstresser discloses a luminescent material having a Ce-activated garnet (YAG:Ce) structure $A_3B_5O_{12}$, in which the first component A is Y and Tb, and B is Al (see Col. 3, line 62, $Y_{3-x-y}Ce_xTb_yAl_5O_{12}$). Berkstresser further teaches the use of said luminescent materials in cathodoluminescent devices (CL devices, such as CRTs) and photoluminescent devices (PL devices, such as LEDs) (see Col. 1, lines 13-17). Yet, Berkstresser is silent in reference to the structure of such devices.

However, Shimizu discloses an LED comprising a radiation source that emits radiation in the blue region of the optical spectrum, said LED uses an arrangement of luminescent materials with the general formula YAG:Ce, which are based on a transparent material such as epoxy resin and urea resin (see Col. 16, line 59), and said arrangement of luminescent materials is dispersed over the transparent material (see Col. 16, line 60 or Col. 8, lines 35-37). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the luminescent material disclosed by Berkstresser in an LED device of Shimizu since Berkstresser

acknowledges the general suitability of the luminescent material in photoluminescent devices, such as LED.

Referring to claim 6, Berkstresser-Shimizu discloses the casting compound further comprising a bonding agent and a diffuser (see Col. 17, lines 16-19 and 26-32 of '925). The same motivation for combining stated in claim 4 above applies.

Referring to claim 7, Berkstresser-Shimizu discloses the luminescent materials being excitable by radiation of 420-490 nm (see Col. 14, lines 43-48 of '925). The same motivation for combining stated in claim 4 above applies.

Regarding claim 8, the combination Berkstresser-Shimizu discloses a garnet with the structure $Y_3(Al, Ga)_5O_{12}:Ce$ [YAG:Ce] and a garnet with a structure $(Y_{3-x-y-z}Ce_xTb_yRE_z)(Al_{5-w}X_w)O_{12}$, where $0 < x \leq 0.06$, $0 < y \leq 0.5$, $0 \leq z \leq 2$, $0 \leq w \leq 3$ and X is Ga (Col. 3, line 62, shows a phosphor with the structure $Y_{3-x-y}Ce_xTb_yAl_5O_{12}$ [YAG:Ce:Tb] of '256). Berkstresser fails to disclose a mixture of luminescent materials containing both garnets.

However, in the same field of endeavor, Shimizu discloses an LED with luminescent materials (phosphor) and teaches that the phosphor may contain two or more yttrium-aluminum garnet fluorescent materials of different composition, activated with cerium and that with such a configuration, light of desired color can be emitted by controlling the emission spectrum of the phosphor according to the property of the light emitting component; so in order to have a light of specified wavelength, it is preferable that the phosphor contains two or more fluorescent materials (see Col. 4, lines 15-26 and Col. 5, lines 61-65). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mixture of luminescent materials (phosphor) containing both garnets (YAG:Ce and YAG:Ce:Tb) since Shimizu teaches

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that the phosphor may contain two or more yttrium-aluminum garnet fluorescent materials of different composition, activated with cerium and that with such a configuration, light of desired color can be emitted by controlling the emission spectrum of the phosphor according to the property of the light emitting component; so in order to have a light of specified wavelength, it is preferable that the phosphor contains two or more fluorescent materials.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berkstresser-Shimizu as applied to claim 4 above, and further in view of Ohno et al. (US 4,801,398).

Shimizu-Berkstresser discloses the claimed invention but is silent in reference to the limitation of "the luminescent pigments having particles sizes $\leq 20 \mu\text{m}$ and a mean particle diameter $d \leq 5 \mu\text{m}$ ". However, Ohno teaches that luminescent particles having a size of $10 \mu\text{m}$ or less are suitable as fluorescent materials in order to obtain high-resolution power, a high degree of fineness and high luminance (see Col. 1, lines 18-19, 64-66). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use luminescent pigments having particles sizes $\leq 20 \mu\text{m}$ and a mean particle diameter $d \leq 5 \mu\text{m}$ since Ohno discloses that luminescent particles having a size of $10 \mu\text{m}$ or less are suitable as fluorescent materials in order to obtain high-resolution power, a high degree of fineness and high luminance.

Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

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Duggal et al., in U.S. Patent No. 6,294,800, discloses a blue emitting LED with a YAG:Ce phosphor.

Park et al., in U.S. Patent No. 5,701,054, teaches that mixed phosphors in order to improve luminosity characteristics, lengthening afterglow time, thus diminishing flickering and preventing VDT syndrome.

Contact Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to German Colón whose telephone number is 703-305-5987. The examiner can normally be reached on Monday thru Friday, from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 703-305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


gc

October 30, 2002


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